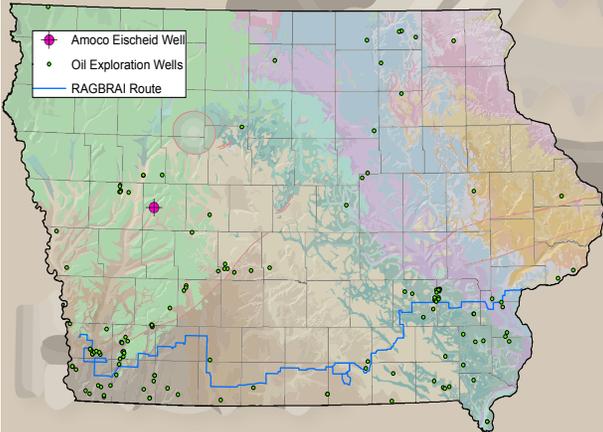


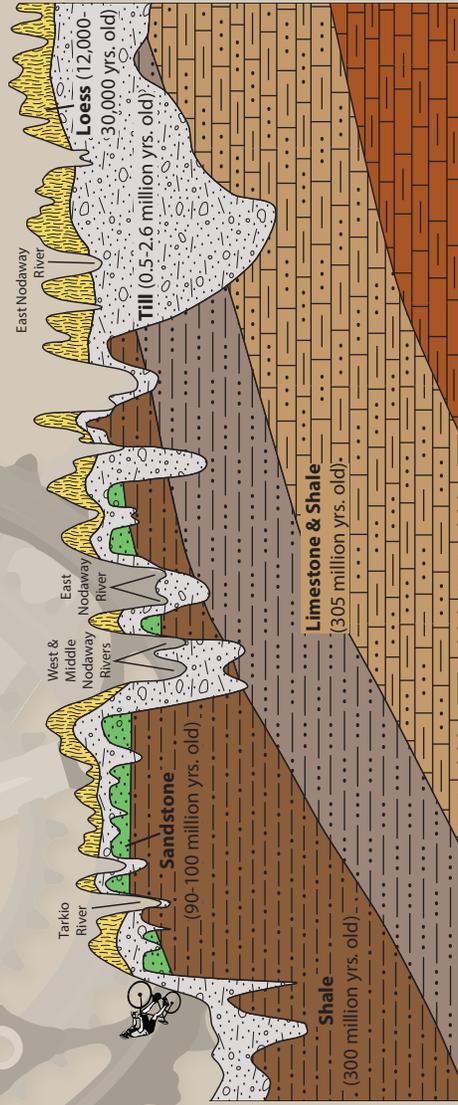
Oil Exploration in Iowa

Since 1903, there have been 134 “wildcat” wells drilled in Iowa. The most recent being in 2008. The first oil ‘show’ occurred in 1925, however, like so many before and since, it did not produce. The 1960’s saw the biggest spike in exploration with 39 wells sunk in Iowa, including the W.F. Flynn #1 well. The Flynn well was drilled in the ‘Keota Dome’ structure in western Washington County looking for, not oil, but a place to store natural gas underground. The well accidentally produced about 370 barrels of oil! The deepest well in Iowa, and the entire Midwest, was the M.G. Eischeid #1 well drilled by Amoco in 1987 near the town of Halbur in Carroll County. It penetrated 17,851 feet into the billion-year-old Mid Continent Rift System and did not produce a single barrel of oil.



Daily Geology:

The majority of this year’s route rolls on the Southern Iowa Drift Plain landform region which is characterized by thin loess cover over generally thick glacial till. The 500,000 years of erosion since the last glacial period allows elaborate drainage systems leading to deeply incised river valleys to form, such as the Nishnabotna and Nodaway rivers. Bedrock strata gradually dip towards the southwest in Iowa toward the structure known as the Forest City Basin.



RAGBRAI

Day 2

2016

Monday, July 25

Learn About the Land



Shenandoah Sloth

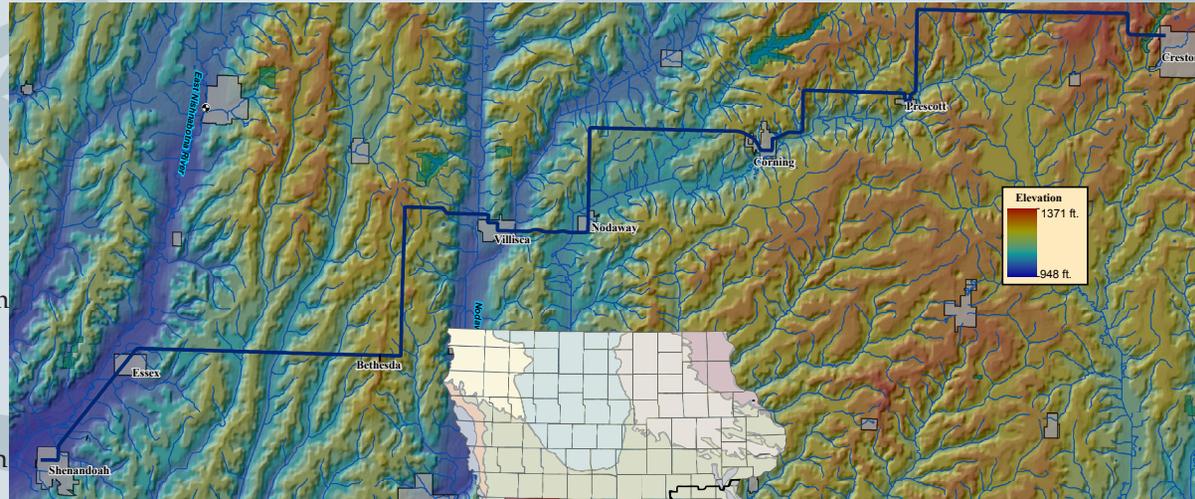
In the summer of 2001, landowners discovered a rare fossil find on their property along West Tarkio Creek near Shenandoah, Iowa. Holmes Semken, emeritus professor in the University of Iowa (UI) Department of Geoscience, identified the bones as belonging to *Megalonyx jeffersonii*, or Jefferson's Ground Sloth. This elephant-sized Ice Age animal, weighing two to three tons and standing nearly 10 feet tall, lived in Iowa for thousands of years until its extinction approximately 12,000 years ago along with many other large mammals. From 2002 through 2010, a joint project between the UI Department of Geoscience, UI Museum of Natural History (which provided the photo below) and the Office of the State Archaeologist excavated bones at the site. Numerous field excursions and nearly 100 volunteers assisted with the project that recovered more than 150 bones. In all, excavations revealed three Jefferson's Ground Sloths and a fourth specimen, that of *Paramylodon harlani*, the first found in Iowa. Two of the *Megalonyx* uncovered were juveniles, marking the first instance of an adult and juvenile found together. Only six partially complete skeletons of *Megalonyx jeffersonii* have ever been found. Efforts were suspended in 2010 after several trips where no additional bones were found.



* Cover photo: A river that shows signs of drought in southern Iowa.

Southwest Iowa Rural Water Systems

A hydrogeologic study was conducted by the Iowa Geological Survey to more fully understand the shallow groundwater resources along the West Nishnabotna River. The West Nishnabotna River aquifer is an alluvial aquifer in southwest Iowa. The aquifer consists of sand and gravel deposits and some terrace deposits associated with the West Nishnabotna River. A computer model of the West Nishnabotna River aquifer was created. The results of the model found a strong interaction between the West Nishnabotna River and the alluvial aquifer. Approximately 50% of the groundwater withdrawn from production wells is generated, or recharged, from the West Nishnabotna River. Precipitation accounts for the remainder of the recharge. The recharge from the river, or induced recharge, provides security for most users of the West Nishnabotna aquifer. As long as the river has water, so too should the residents.



-  USGS streamflow station
-  Parks and preserves
-  Cities and towns



Iowa Rocks!! *If it can't be grown it has to be mined*



Everything we have and everything we use comes from our natural resources.

Water Quality Data in Real Time

Researchers at IIHR have developed an easy-to-use web platform to disseminate data collected from in-stream water-quality sensors across the state. The Iowa Water Quality Information System (IWQIS) displays real-time data on nitrate and other parameters in a GoogleMaps interface. This new information makes it possible for Iowans to use a science-based approach when making decisions that affect water quality. Scientists and stakeholders are tracking stream data with IWQIS to assess the effectiveness of the Iowa Nutrient Reduction Strategy conservation practices and progress toward water-quality goals. The monitoring network totals 55 sites in 2016, including 15 U.S. Geological Survey sensors. Coverage includes all the state's major rivers. For the first time, water-quality researchers at IIHR and elsewhere are able to quantify the total amount of nitrate-nitrogen leaving Iowa in the state's rivers. This will be critical information as scientists and policy-makers move toward meeting Iowa's water-quality needs.

